

1           CLAIMS:

2       1. A screen assembly for a vibratory separator, the screen  
assembly comprising

3                 a frame with a first frame end spaced apart from a  
4                 second frame end by two opposed spaced-apart sides including  
5                 a first side and a second side,

6                 screening material on the frame,

7                 a plurality of crossmembers spaced apart and  
8                 extending from the first side to the second side, each  
9                 crossmember of the plurality of crossmembers connected to the  
10                first side and the second side, and

11                each crossmember of the plurality of crossmembers  
12                having at least one series of openings therethrough.

1       2. The screen assembly of claim 1 wherein each crossmember  
2                has a length and the at least one series of openings extending  
3                along substantially all of said length.

1       3. The screen assembly of claim 1 wherein the at least one  
2                series of openings is two parallel spaced-apart series of  
3                crossmembers.

1       4. The screen assembly of claim 1 wherein the openings of  
2                the at least one series of openings are triangular in shape.

1       5. The screen assembly of claim 4 wherein alternating  
2                openings are inverted with respect to openings adjacent thereto.

1       6. The screen assembly of claim 1 further comprising  
2                 a plurality of spaced-apart rods connected between  
3                 and to the first frame end and the second frame end,

4                 each rod of the plurality of spaced-apart rods  
5                 passing through the plurality of crossmembers.

1       7. The screen assembly of claim 1 wherein each of the two  
2                spaced-apart sides has a series of side openings.

1       8. The screen assembly of claim 7 wherein each of the two  
2                spaced-apart sides has a series of cut out portions.

2       9. The screen assembly of claim 8 wherein the side openings  
3 are not lined up with the cut out portions.

1       10. The screen assembly of claim 1 at least one of the first  
2 frame end and the second frame end has a series of spaced-apart  
3 openings.

1       11. The screen assembly of claim 1 wherein the at least one  
2 series of openings therethrough comprises a series of spaced-apart  
3 openings so that each of said crossmembers is a truss-like  
4 structure.

1       12. The screen assembly of claim 1 wherein at least one  
2 crossmember of the plurality of crossmembers has a "V" shape when  
3 viewed on end, the "V" shape comprising a first leg connected to a  
4 second leg, at least one of said legs having a series of spaced-  
5 apart openings therethrough.

1       13. The screen assembly of claim 10 wherein the at least one  
2 of said legs is both legs each with a series of spaced-apart  
3 openings therethrough.

1       14. The screen assembly of claim 1 wherein the screening  
2 material is a plurality of superimposed layers of screening  
3 material.

1       15. The screen assembly of claim 14 wherein the plurality of  
2 layers of screening material are connected together and are  
3 connected to the plurality of crossmembers.

1       16. The screen assembly of claim 1 further comprising  
2                  at least one spring member disposed between the  
3 frame and the screening material.

1       17. The screen assembly of claim 1 wherein at least one of  
2 the crossmembers comprises a wire grid structure.

1       18. The screen assembly of claim 17 wherein the wire grid  
2 structure includes a plurality of adjacent wire pyramid structures.

2           19. The screen assembly of claim 1 further comprising  
3                 a plurality of holding portions including a  
4                 plurality of holding portions on each of the first side and the  
5                 second side, each of the plurality of holding portions for holding  
6                 one of the plurality of crossmembers, each holding portion  
7                 extending inwardly from a surface of the first side or of the  
8                 second side,

9                 each holding portion connected to a corresponding  
10                crossmember,

11                each crossmember having two ends and a holding  
12                portion connected to each of said ends.

1           20. The screen assembly of claim 19 wherein each holding  
2                portion has a recess therein and part of a corresponding  
3                crossmember is disposed within said recess.

1           21. A vibratory separator for treating material introduced  
2                thereto, the vibratory separator comprising

3                 screen assembly holding apparatus,

4                 vibration apparatus for vibrating a screen assembly  
5                 on the screen assembly holding apparatus, and

6                 at least one screen assembly on the screen assembly  
7                 holding apparatus, the at least one screen assembly comprising  
8                 a frame with a first frame end spaced apart from a second  
9                 frame end by two opposed spaced-apart sides including a first  
10                side and a second side, screening material on the frame, a  
11                plurality of crossmembers spaced apart and extending from the  
12                first side to the second side, each crossmember of the  
13                plurality of crossmembers connected to the first side and the  
14                second side, and each crossmember of the plurality of  
15                crossmembers having at least one series of openings  
16                therethrough.

2           22. A method for treating material with a vibratory  
3       separator, the method comprising

4                 introducing material to be treated to a vibratory  
5       separator, the vibratory separator comprising

6                 screen assembly holding apparatus including  
7       screen mounting structure,

8                 vibration apparatus for vibrating a screen  
9       assembly on the screen assembly holding apparatus,

10                 at least one screen assembly on the screen  
11       assembly holding apparatus, the at least one screen  
12       assembly comprising a support for screening material, a  
13       plurality of crossmembers spaced apart and extending from  
14       the first side to the second side, each crossmember of  
15       the plurality of crossmembers connected to the first side  
16       and the second side, and at least one of the crossmembers  
17       of the plurality of crossmembers having at least one  
18       series of openings therethrough.

19       23. The method of claim 22 further comprising a method for  
20       mounting the screen assembly to the screen mounting structure of  
21       the vibratory separator to facilitate sealing of an interface  
22       between the the screen assembly and the screen mounting structure,  
23       the screen mounting structure including a plurality of support  
24       members extending from a first separator side of the vibratory  
25       separator to a second separator side thereof with material flowable  
26       between said sides in a first direction that is a direction  
27       generally parallel to said sides, the screen assembly having a  
28       support and screening material on the support for treating  
29       material introduced to the vibratory separator, the support  
30       including four interconnected sides including two pairs of sides,  
31       a first pair with a first side and a second side and a second pair  
32       with a third side and a fourth side, the first side spaced-apart  
33       from the second side by spaced-apart third and fourth sides, the  
34       first side and the second side generally parallel to the first

35 separator side and the second separator side upon installation of  
36 the screen assembly in the vibratory separator, the support having  
37 generally screening material thereon, the support having a  
38 plurality of spaced-apart longitudinal crossmembers extending  
39 between and connected to only one of the pairs of sides, each  
40 longitudinal crossmember not in contact with the third side and the  
41 fourth side, the screen mounting structure including crowning  
42 apparatus for forcible abutment against the third side and the  
43 fourth side of the support to effect bending of the first side and  
44 the second side of the support and thereby effect crowning of the  
45 screen assembly within the vibratory separator, the method  
46 comprising

47                 locating the screen assembly on the screen mounting  
48                 structure,

49                 positioning the screen assembly with respect to the  
50                 screen mounting structure so that the longitudinal  
51                 crossmembers are all either generally transverse to the first  
52                 direction, and

53                 forcing the first and second sides of the support  
54                 down with the crowning apparatus to effect crowning of the  
55                 screen assembly, the support rigid yet sufficiently flexible  
56                 so that with the screen assembly in a crowned configuration  
57                 the third side and the fourth side each along substantially  
58                 all of the length thereof sealingly contact a surface of the  
59                 screen mounting structure.

1                 24. The screen assembly of claim 23 wherein the plurality of  
2                 longitudinal crossmembers of the support includes a first  
3                 longitudinal crossmember and a second longitudinal crossmember and  
4                 at least one transverse crossmember extending between and connected  
5                 to the first longitudinal crossmember and the second longitudinal  
6                 crossmember.

1           25. The screen assembly of claim 24 wherein the at least one  
2 transverse crossmember is two transverse crossmembers equally  
3 spaced-apart from each other and from the first and second sides of  
4 the support.

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